

Application No. 10/027,667
Docket No. 8828LS
Response dated February 8, 2007
Reply to Office Action of September 14, 2006
Customer No. 27752

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Currently amended) An apparatus for electrolyzing an electrolytic solution ~~having chloride salt~~, said apparatus comprising:

(a) at least one non-barrier electrolytic cell further comprising:

(i.) an anode;

(ii.) a cathode, and a passage connecting said anode and cathode adjacent to the anode of said non-barrier electrolytic cell; said passage having a distance between said anode and said cathode of less than about 0.6 mm;

(iii.) an inlet port in fluid communication with said passage, said inlet port configured to receive a flow of electrolytic solution comprising from about 10 to about 200 ppm of sodium chloride; and

(iv.) an outlet port in fluid communication with said passage, said outlet port providing configured to provide an exit for the flow of electrolytic solution having been electrolyzed the electrolytic solution comprising from about 2 ppm or less of chloride ions; and

(v) a direct current power supply ~~having less than about 2.7 watts of power~~ providing an electrical current between said anode and said cathode, whereby the electrical current electrolyzes the electrolytic solution between said anode and said cathode; and

(b) an electrolytic solution comprising natural water and residual salts, wherein said natural water is selected from the group consisting of well water, river water, tap water, softened water, industrial process water and waste water.

2. (Currently amended) The apparatus according to Claim 1 wherein said apparatus further comprises a body, said body providing containment for said electrolytic cell and said current supply and wherein said apparatus yields a Productivity Index ~~[[is]]~~ of at least 300.

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3. (Previously presented) The apparatus according to Claim 1 wherein said apparatus further comprises a fluid movement mechanism for moving electrolytic solution into said inlet port and out of said outlet port.

4. (Original) The apparatus according to Claim 3 wherein said fluid movement mechanism recirculates electrolytic solution that has exited said outlet port back into said inlet port in order to repeat the electrolyzing of the electrolytic solution.

5. (Previously presented) The apparatus according to Claim 1 wherein said apparatus further comprises a filter for removal of impurities.

6. (Original) The apparatus according to Claim 5 wherein said filter is positioned before said electrolytic cell.

7. (Original) The apparatus according to Claim 5 wherein said filter is positioned after said electrolytic cell.

8. (Previously presented) The apparatus according to Claim 5 wherein said filter has a size to remove 99.95% of particulates having a size of at least 3 microns or greater from the electrolytic solution.

9. (Previously presented) The apparatus according to Claim 5 wherein said is structured to remove organic species.

10. (Original) The apparatus according to Claim 9 wherein said filter is positioned after said electrolytic cell and said electrolytic cell converts the organic species to a form that is removable by said filter.

11. (Previously presented) The apparatus according to Claim 5 wherein said filter is structured to remove inorganic species.

12. (Original) The apparatus according to Claim 11 wherein said filter is positioned after said electrolytic cell and said electrolytic cell converts the oxidation state of inorganic species to a state that is removable by said filter.

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13. (Previously presented) The apparatus according to Claim 11 wherein said filter is structured to remove arsenic.

14. (Original) The apparatus according to Claim 11 wherein said filter is positioned after said electrolytic cell and said electrolytic cell converts the oxidation state of arsenic to a state that is removable by said filter.

15. (Original) The apparatus according to Claim 11 wherein said filter is positioned after said electrolytic cell.

16. (Original) The apparatus according to Claim 5 wherein said filter is constructed in part or in total of a resin.

17. (Original) The apparatus according to Claim 5 wherein said filter is constructed in part or in total of carbon.

18. (Previously presented) The apparatus according to Claim 1 wherein said apparatus further comprises an ion exchange resin usable as a pre-treatment to the electrolytic solution prior to electrolysis.

19. (Previously presented) The apparatus according to Claim 18 wherein said ion exchange resin increases the halogen-containing ion concentration of the electrolytic solution upon contact therewith.

20. (Previously presented) The apparatus according to Claim 18 wherein said ion exchange resin decreases the concentration of scale-forming ions from the electrolytic solution upon contact therewith.

21. (Original) The apparatus according to Claim 18 wherein said ion exchange resin is a water softener.

22. (Previously presented) The apparatus according to Claim 1 wherein said apparatus further comprises a water-presence sensor capable of triggering the start of the

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electrolysis process in the presence of water and also capable of triggering the stop of the electrolysis process in the absence of water.

23. (Previously presented) The apparatus according to Claim 22 wherein said water-presence sensor comprises a field effect transistor.

24. (Original) The apparatus according to Claim 1 wherein said current supply is selected from a group consisting of battery, ac-dc converter, solar cell, manual crank generator system, water pressure/turbine energy system and combinations thereof.

25. (Original) The apparatus according to Claim 1 wherein said anode is a foil electrode.

26. (Original) The apparatus according to Claim 1 wherein said anode comprises a Group VIII metal.

27. (Original) The apparatus according to Claim 1 wherein the anode is a porous anode.

28. (Previously presented) The apparatus according to Claim 27 wherein the porous anode is a porous metallic anode.

29. (Previously presented) The apparatus according to Claim 1 wherein said apparatus is structured as a device selected from the group consisting of: faucet-mounted filters, counter-top water purification devices, under-sink water purification devices, camping/backpack water purification devices, travel water purification devices, refrigerator water purification devices, pitcher-type gravity flow water purification devices, bathing water purification devices, and spa-type water purification devices.

30. (Canceled).

31. (Previously presented) The apparatus according to Claim 1 wherein said apparatus kills microorganisms upon electrolyzing the electrolytic solution.

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32. (Currently amended) An apparatus for electrolyzing natural water ~~an electrolytic solution~~, said apparatus comprising:

at least one non-membrane electrolytic cell further comprising:

- (a) an anode comprising a surface area of less than about 30 cm²;
- (b) a cathode, and a passage connecting said anode and cathode adjacent to the anode of said non-membrane electrolytic cell; said passage having a distance between said anode and said cathode of less than about 0.6 mm;
- (c) an inlet port in fluid communication with said passage, said inlet port configured to receive a flow of ~~electrolytic solution~~ un-electrolyzed natural water comprising from about 10 to about 200 ppm of a naturally-present halide salt; and
- (d) an outlet port in fluid communication with said passage, said outlet port ~~providing~~ configured to provide an exit for ~~the flow of electrolytic solution having been electrolyzed~~ the electrolyzed natural water comprising from about 2 ppm or less of halide ions; and
- (e) a current power supply for providing an electrical current between said anode and said cathode, ~~wherein said current power supply has less than about 2.7 watts of power~~, whereby the electrical current electrolyzes the ~~electrolytic solution~~ un-electrolyzed natural water between said anode and said cathode.

Claims 33-40 (Canceled).

41. (Currently amended) The apparatus according to Claim 32 wherein ~~[[said]]~~ a filter is positioned after said electrolytic cell and said electrolytic cell converts the oxidation state of inorganic species to a state that is removable by ~~[[a]]~~ the filter.

Claims 42-93 (Canceled).

94. (Withdrawn) An electrolysis apparatus comprising:

at least one cell chamber;

at least one electrolytic cell with at least one anode and at least one cathode, wherein at least one pair of an anode and a cathode is separated by a porous barrier;

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a reservoir connected to said at least one electrolytic cell by a passage;

at least one pump connected to said reservoir and passage; and

at least one battery connected to said at least one anode and said at least one cathode
providing less than 8.5 watts of power.